

THE CLAIMS

What is claimed is:

1. A pressure washer comprising:

5 a pump having a fluid inlet for a fluid and a first chemical inlet 38 for a first chemical, said pump being configured to selectively pump a fluid at a pressure that ranges from low to high, and to selectively pump a fluid combined with a first chemical in a low pressure range; and

10 an injector coupled to the pump, the injector having a nozzle and an external member, with the nozzle having an internal passageway and an external passageway, and the external member being positioned at least in part around the nozzle and the external passageway, the external member having a second chemical inlet positioned downstream from the nozzle for supplying a second chemical into a fluid, wherein the injector is configured to spray at least one of a fluid or a fluid and a first chemical in the low pressure range, and at least one of a
15 fluid or a fluid and a second chemical in the high pressure range.

2. The pressure washer of claim 1, further comprising a spray lance coupled to the injector and a hose coupled between the pump and the spray lance, with the spray lance and the injector receiving a fluid or a fluid combined with a first chemical from the pump via
20 the hose.

3. The pressure washer of claim 2, further comprising a first chemical housing coupled to the first chemical inlet and configured to house a first chemical, and a second chemical housing coupled to the second chemical inlet and configured to house a second
25 chemical.

4. The pressure washer of claim 3, wherein the second chemical housing comprises a tank coupled to the spray lance and the first chemical housing comprises a tank coupled to the pump.
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5. The pressure washer of claim 3, wherein the first chemical housing is coupled to a valve for opening the flow of a first chemical from the first chemical housing to the first chemical inlet, and the second chemical housing is coupled to a valve for opening the flow of a second chemical from the second chemical housing to the second chemical inlet.

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6. The pressure washer of claim 3, wherein the pump and the first chemical housing are positioned on a cart, and further comprising a motor associated with the pump.

7. The pressure washer of claim 4, wherein the tank is coupled to the spray lance via at least one clip, such that the tank is integral with, but removable from the spray lance.

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8. The pressure washer of claim 4, wherein the tank comprises an elongated, hollow member made of a non-corrosive material having an open end positioned in the vicinity of the injector, the open end being closed by a cap, with a conduit coupled to the cap for connecting the tank to the second chemical inlet of the injector.

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9. The pressure washer of claim 8, wherein the cap comprises at least three operative positions, a first operative position where a second chemical is permitted to flow from the tank when the tank is in an inverted position, a second operative position where a second chemical is permitted to flow from the tank when the tank is in an upright position, and a third closed position where a second chemical is prevented from flowing through the cap.

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10. The pressure washer of claim 8, further comprising a check valve associated with the conduit and the second chemical inlet of the injector.

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11. The pressure washer of claim 2, further comprising a spray gun connected to the spray lance, with the spray gun having a trigger and a handle, the trigger being associated with a flow path of a fluid or a fluid combined with a first chemical from the pump and being operative to open and close the flow path.

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12. The pressure washer of claim 1, wherein the external member is movable relative to the nozzle and includes a first operative position where the external passageway is closed and a second operative position where the external passageway is open, and a fluid or a fluid combined with a first chemical flow through both the internal passageway and the external passageway when the external member is in the second operative position.

13. The pressure washer of claim 1, wherein the external member includes a cover and an injector body, with the injector body being positioned inside the cover and the cover being rotatable relative to the injector body; and the nozzle further comprises a collar positioned between the injector body and the nozzle around the external passageway, with the collar being axially movable with the injector body and cover to open and close the external passageway.

14. The pressure washer of claim 13, wherein the external member further comprises a flow directing member positioned inside the external member and the cover is rotatable to change a spray pattern of a fluid from the injector by moving the flow directing member.

15. The pressure washer of claim 1, wherein the external member is made of a non-corrosive material and the nozzle is made of a metallic material.

16. The pressure washer of claim 1, further comprising a first venturi coupled to the pump upstream of the first chemical inlet, said first venturi for suctioning the first chemical into the fluid; and a second venturi positioned within the injector body upstream of the second chemical inlet, said second venturi for suctioning the second chemical into the fluid.

17. The pressure washer of claim 1, wherein the nozzle comprises a nozzle body and a nozzle tip coupled to the nozzle body, with the nozzle tip having a flow restricting portion.

18. The pressure washer of claim 1, wherein the low pressure range comprises pressures of about 25 to about 200 psi and the high pressure range comprises pressures of about 500 to about 3200 psi.

5 19. A pressure washer comprising: ~
a pump for pumping a fluid at at least a low pressure and a high pressure;
an injector coupled to the pump that has a restrictive nozzle for spraying the fluid;
and

at least one chemical source for injecting a chemical into the fluid,
10 wherein the pressure washer has at least three modes of operation, including a first
mode comprising a low pressure spray of the fluid combined with the chemical, a second
mode comprising a high pressure spray of the fluid, and a third mode comprising a high
pressure spray of the fluid combined with the chemical, with the fluid flowing through the
nozzle in the second and third modes and the fluid combined with the chemical flowing
15 through and around the nozzle in the first mode.

20. The pressure washer of claim 19, further comprising a fourth mode of
operation comprising a low pressure spray of the fluid, wherein the fluid flows through and
around the nozzle in the fourth mode.

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21. The pressure washer of claim 19, further comprising a spray lance coupled to
the injector, and a hose coupled between the pump and the spray lance for transferring the
fluid from the pump to the spray lance and injector, wherein the spray lance includes a flow
through shaft.

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22. The pressure washer of claim 21, wherein the at least one chemical source
comprises a first chemical source associated with the pump and a second chemical source
associated with the spray lance, wherein the first chemical source supplies a first chemical
into the fluid during the first mode and the second chemical source supplies a second
30 chemical into the fluid during the third mode.

23. The pressure washer of claim 19, wherein the low pressure fluid comprises a pressure range of about 25 to about 200 psi and the high pressure fluid comprises a pressure range of about 500 to about 3200 psi.

5 24. A pressure washer injector comprising:
a metallic nozzle having an axially extending internal passageway that includes a flow restricting portion, the nozzle for receiving a fluid under pressure from a pressure washer; and
a non-metallic external member positioned around at least part of the nozzle and
10 including a chemical inlet and a venturi positioned upstream from the chemical inlet.

25. The pressure washer injector of claim 24, wherein the nozzle comprises a nozzle body coupled to a nozzle tip, with the nozzle tip including the flow restricting portion.

15 26. The pressure washer injector of claim 24, wherein the metallic nozzle is brass and the non-metallic external member is plastic, the external member is movable and rotatable relative to the nozzle, and the chemical inlet is positioned downstream from the nozzle.

20 27. The pressure washer injector of claim 24, wherein the external member comprises an injector body and a cover; and further comprising a collar positioned around the nozzle and movably associated with the injector body, with the collar defining an external flow passageway around the nozzle and the injector body being at least in part positioned between the cover and the collar.

25 28. The pressure washer injector of claim 26, wherein the injector body and the cover are movable axially, the cover is rotatable, and the collar is metallic.

29. The pressure washer injector of claim 26, further comprising a flow directing
30 member positioned inside the cover and operable to change a spray pattern of the injector when the cover is rotated.

30. An injector comprising:
a metallic nozzle having an axially extending internal passageway, said internal passageway including a flow restricting portion; and
5 a non-metallic external member movably disposed around at least part of the nozzle and including a chemical inlet positioned downstream from the nozzle.

31. The injector of claim 30, wherein the nozzle comprises a nozzle body and a nozzle tip, with the nozzle tip including the flow restricting portion.

32. The injector of claim 30, further comprising a venturi defined in the external member positioned upstream from the chemical inlet.

33. The injector of claim 30, wherein the external member is configured to move axially relative to the nozzle between a high pressure position in which a fluid is forced through the internal passageway of the nozzle and a low pressure position in which a fluid is permitted to flow both through the internal passageway and around at least part of the nozzle.

34. The injector of claim 33, wherein the external member is rotatable in order to provide more than one spray pattern of the fluid flow.

35. The injector of claim 30, wherein the nozzle is brass and the external member is plastic.

36. The injector of claim 30, wherein the external member includes an injector body and a cover, with the injector body being positioned between the nozzle and the cover, and the cover disposed around the injector body; and

further comprising a collar positioned between the nozzle and the injector body, the collar being movable with the injector body and defining an external passageway around the nozzle.

37. The injector of claim 36, wherein the collar is metallic, the injector body and cover are movable axially, and the cover is rotatable.

38. The injector of claim 37, further comprising a flow directing member
5 positioned inside the cover and operable to change a spray pattern of the injector when the cover is rotated.